THIS IS A LEGACY SPECIFICATION

OCR
RECOGNISING ACHIEVEMENT

ADVANCED SUBSIDIARY GCE

HUMAN BIOLOGY

Growth, Development and Disease

2857

Candidates answer on the question paper

OCR Supplied Materials:
None

Other Materials Required:
- Electronic calculator
- Ruler (cm/mm)

Thursday 8 January 2009
Morning

Duration: 1 hour

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- The total number of marks for this paper is **60**.
- You will be awarded marks for the quality of written communication where this is indicated in the question.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.
- This document consists of **16** pages. Any blank pages are indicated.

FOR EXAMINER'S USE		
Qu.	**Max.**	**Mark**
1	**10**	
2	**12**	
3	**12**	
4	**8**	
5	**9**	
6	**9**	
TOTAL	**60**	

Answer **all** the questions.

1 Cancer cells in the lungs may form a tumour, which can lead to blockage of the airways.

(a) State **three** ways in which lung cancer cells are different from normal lung cells.

1 .....

2 .....

3 ..... **[3]**

(b) **(i)** Describe how X-rays can be used to **detect** lung cancer.

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..... **[3]**

(ii) State **two** methods used to **treat** lung cancer.

1 .....

2 ..... **[2]**

(c) Many cases of lung cancer are related to smoking.

Describe **two** pieces of **epidemiological** evidence that link lung cancer to smoking.

1 .....

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2 .....

..... **[2]**

[Total: 10]

2 Fig. 2.1 shows part of a DNA molecule.

Some of the organic bases have been labelled.

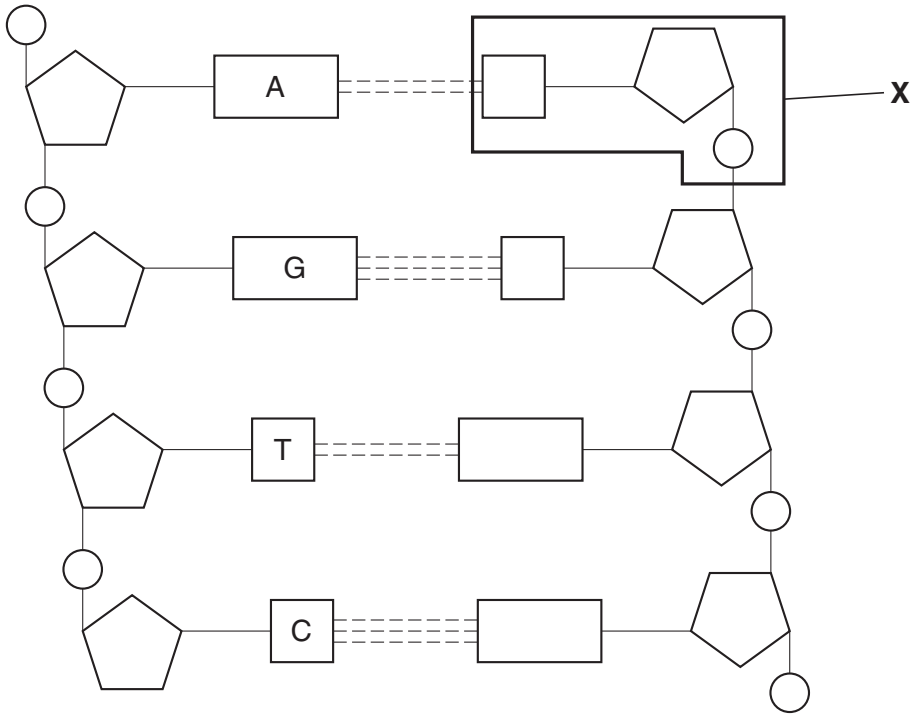

Fig. 2.1

(a) (i) Name the part of the DNA molecule labelled **X** in Fig. 2.1.

..... **[1]**

(ii) Complete Fig. 2.1 by adding an appropriate letter to each of the four unlabelled bases. **[2]**

(b) In this question one mark is available for the quality of spelling, punctuation and grammar.

DNA is copied by the process of semi-conservative replication.

Describe the process of semi-conservative replication **and** explain its importance.

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..... **[8]**

Quality of Written Communication **[1]**

[Total: 12]

3 It can take 10-15 years for an HIV-infected person to develop AIDS.

Fig. 3.1 shows the changes in the concentration of anti-HIV antibodies following infection with the HIV virus.

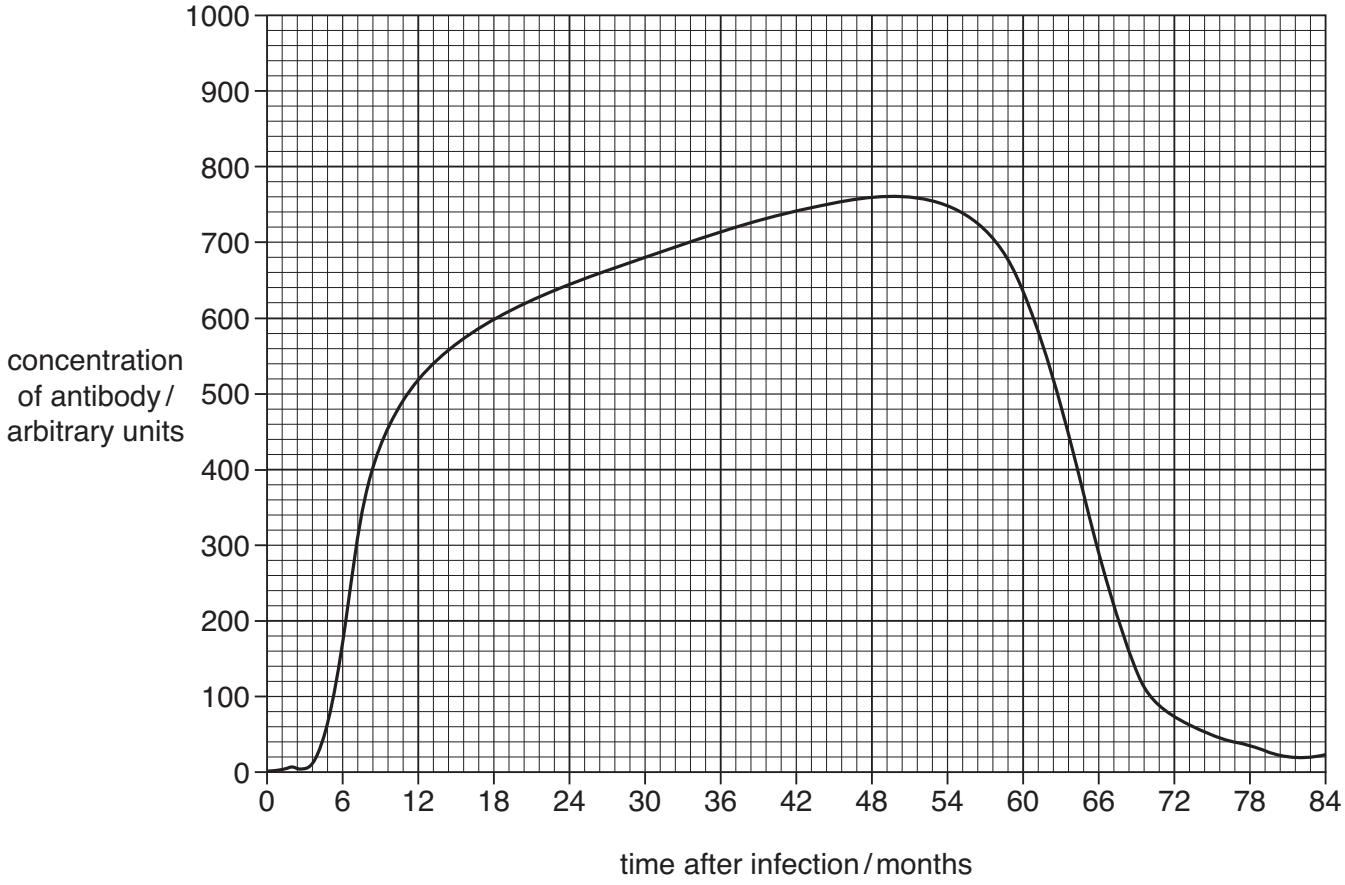

Fig. 3.1

(a) Using Fig. 3.1, describe **and** explain the changes in the concentration of anti-HIV antibodies between **0 and 12** months after infection with HIV.

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..... **[4]**

(b) Table 3.1 shows the percentage of people with HIV/AIDS in the USA and Sub-Saharan Africa in 2005.

Table 3.1

region	percent of people with HIV/AIDS who are:		
	women	men	children
USA	24	75	1
Sub-Saharan Africa	54	38	8

In 2005, the estimated number of people living with HIV/AIDS in Sub-Saharan Africa was 24 500 000.

(i) Using the data from Table 3.1, calculate the **number** of children with HIV/AIDS in Sub-Saharan Africa.

Show your working.

Answer = ... **[2]**

(ii) Use the data in Table 3.1 to describe the differences between the population with HIV/AIDS in the USA and in Sub-Saharan Africa.

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..... **[2]**

(iii) Suggest reasons for the differences described in **(b)(ii)**.

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..... **[2]**

(c) Suggest why 24 500 000 may **not** have been an accurate estimate of the number of people with HIV/AIDS in Sub-Saharan Africa in 2005.

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..... **[2]**

[Total: 12]

4 **(a)** The Human Genome Project was started in 1990.

This project has provided information about the inheritance of some genetic diseases.

(i) What is the human genome?

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..... **[1]**

(ii) State **two** other aims of the Human Genome Project.

1 .....

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2 .....

..... **[2]**

(b) Discuss the ethical and social implications of diagnosing genetic disease.

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..... **[5]**

[Total: 8]

5 Infant development is carefully monitored by skilled health specialists.

(a) (i) Describe one method of determining the **relative** growth rate of an infant.

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..... **[3]**

(ii) State **one** role of vitamin D and **one** role of protein in maintaining the healthy growth of an infant.

role of vitamin D .....

.....

role of protein .....

..... **[2]**

(b) Fig. 5.1 shows the growth of some human organs from birth to 20 years.

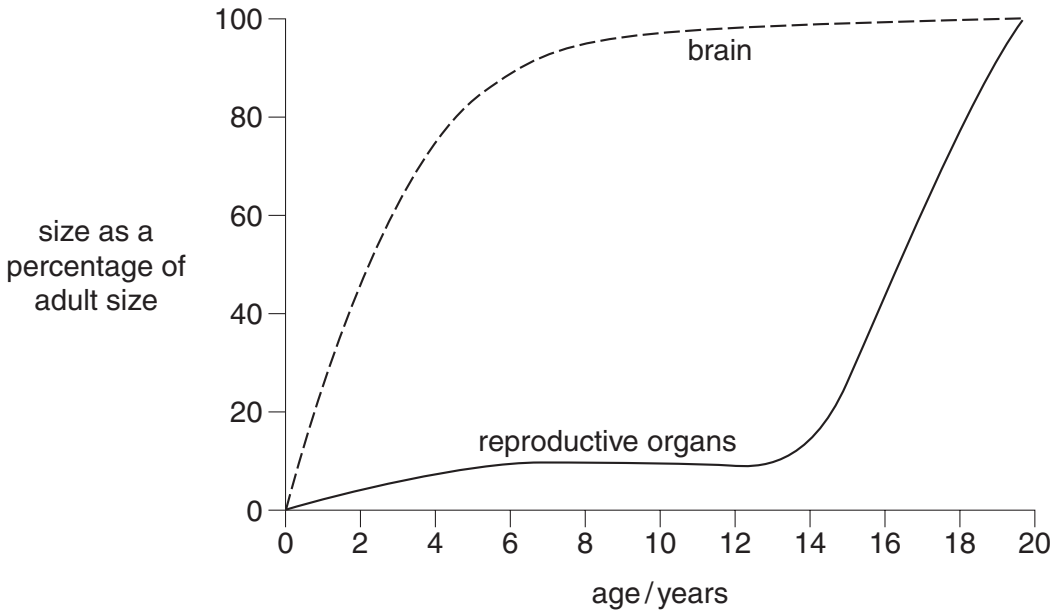

Fig. 5.1

(i) Using Fig. 5.1, describe the pattern of growth of the brain.

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..... **[2]**

(ii) Describe how the pattern of growth of the reproductive organs differs from that of the brain.

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..... **[2]**

[Total: 9]

6 Genetic diseases are caused by mutations.

(a) (i) Explain what is meant by a gene (point) mutation.

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..... **[3]**

(ii) State **two** factors that increase the risk of a mutation occurring.

1 .....

2 ..... **[2]**

QUESTION 6 CONTINUES ON PAGE 13

Fig. 6.1 shows a diagram of a haemoglobin molecule.

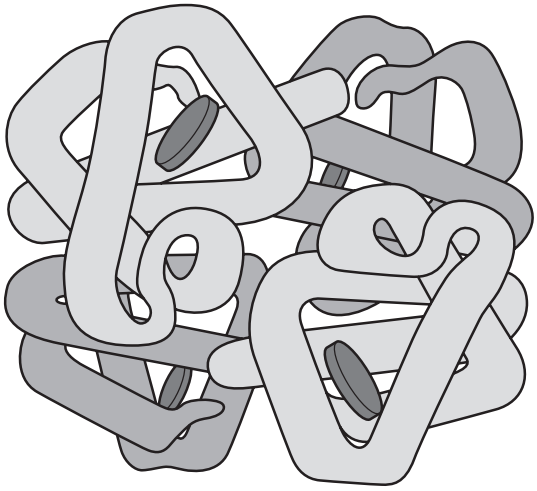

Fig. 6.1

(b) Explain how a mutation in the gene that codes for one of the polypeptide chains may result in the production of abnormal haemoglobin, giving rise to sickle cell anaemia.

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..... **[4]**

[Total: 9]

END OF QUESTION PAPER

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